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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/586,050	06/02/2000	Todd O. Bolken	MICS:0038	5710

7590 04/10/2002

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EXAMINER

TRAN, THANH Y

ART UNIT PAPER NUMBER

2841

DATE MAILED: 04/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/586,050

Applicant(s)

BOLKEN ET AL.

Examiner

Thanh Y. Tran

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-17,19-33 and 35-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-17,19-33 and 35-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 13-17, 29-33, 45-47 and 53-54 are rejected under 35 U.S.C. 102(e) as being anticipated by Moden et al. (U.S. 6,297,960).

As to claim 1, Moden et al. discloses a system (Fig. 1) which *inherently* comprising a processor; and a memory device (10) *inherently* operatively coupled to the processor [it should be noted that a computer *inherently* has a processor which is coupled to a memory device for performing electrical functions], the memory device (10) comprising a plurality of vertically stacked ball grid arrays (106), each ball grid array (106) having a memory chip (102), and wherein the vertically stacked ball grid arrays comprise: a plurality of packages (104), each of the plurality of packages (104) comprising a plurality of mateable alignment features (see Fig. 9, elements 152, 154 & 156), and wherein each of the plurality of packages (104) is physically

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coupled to another of the plurality of packages (104) (see Fig. 9); and a plurality of memory chips (102), each of the plurality of memory chips (102) physically coupled to a respective one of the plurality of packages (104).

As to claim 13, Moden et al. discloses a system (Fig. 9) wherein each of the plurality of packages (104) is electrically coupled to another of the plurality of packages (104) using solder balls (106).

As to claim 14, Moden et al. discloses a memory board (Fig. 1) wherein each of the plurality of packages (104) comprise vias extending therethrough to connect solder balls of adjacent packages serially (see Fig. 1, element 104; col. 3, lines 20-55).

As to claim 15, Moden et al. discloses a memory board (Fig. 1) comprising a substrate (12); and a memory device (10) operatively coupled to the substrate (12), the memory device (10) comprising a plurality of vertically stacked ball grid arrays (106), each ball grid array having a memory chip (102), and wherein the vertically stacked ball grid arrays comprise: a plurality of packages (104), each of the plurality of packages (104) comprising a plurality of mateable alignment features (see Fig. 9, elements 152, 154, 156), and wherein each of the plurality of packages (Fig. 9, element 104) is physically coupled to another of the plurality of packages (104); and a plurality of memory chips (102), each of the plurality of memory chips (102) coupled to a respective one of the plurality of packages (104) (see Fig. 9).

As to claim 16, Moden et al. discloses a memory board (Fig. 1) wherein the substrate (12) is a printed circuit board.

As to claim 17, Moden et al. discloses a memory board (Fig. 1) comprising a memory controller operatively coupled to the memory device (10) and to the substrate (12) [it should be

noted that a computer which *inherently* includes a memory controller operatively coupled to the memory device for performing electrical functions].

Claims 29-30 recites limitations similar to claims 13-14. Therefore, they are rejected for the same reasons

As to claim 31, figures 1 and 9 show a first ball grid array (106) is coupled to a second ball grid array.

As to claim 32, figures 1 and 9 show the first ball grid array is serially coupled to the second ball grid array.

Claim 33 recites limitations similar to claim 15. Therefore, it is rejected for the same reasons.

Claim 45 recites limitations similar to claim 13. Therefore, it is rejected for the same reasons.

Claim 46 recites limitations similar to claim 14. Therefore, it is rejected for the same reasons.

As to claim 47, Moden et al. discloses a device (Fig. 1) comprising a chip (102); and a package (104) operatively coupled to the chip (102), the package (104) comprising: a first side; a second side; a plurality of first mateable alignment features (see Fig. 9, element 152) on the first side of the package; and a plurality of second mateable alignment features (154, 156) on the second side of the package

As to claim 53, Moden et al. discloses a device (Fig. 1) wherein there are a plurality of memory chips (102), each of the plurality of memory chips (102) coupled to a package (104).

As to claim 54, Moden et al. discloses a package (Fig. 1, element 104) comprising: a first side; a second side; a plurality of first mateable alignment features (Fig. 1, element 152) on the first side of the package; and a plurality of second mateable alignment features (154, 156) on the second side of the package.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-12, 19-28, 35-44, 48-52 and 55-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moden et al. (U.S. 6,297,960) in view of Mostafazadeh et al. (U.S. 5,783,870).

As to claim 3, Moden et al. does not disclose each package (104) comprises a molded resin body having a die side and a wire side. Mostafazadeh et al. discloses a system (see Figs. 5, 6 and 7H) wherein each package comprises a molded resin body (see Fig. 7D, element 118) having a die side and a wire side (116) (see Fig. 7D, elements 110, 116 and 118). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the package of Moden et al., to include a molded resin body having a die side and a wire side as taught by Mostafazadeh et al., in order to protect the electronic component of the package from being damaged caused by the effect of environment.

As to claim 4, Moden et al. discloses a system (Fig. 1) wherein each package comprises a plurality of first mateable alignment features (see Fig. 9, element 152) on the die side of the

package (104); and a plurality of second mateable alignment features (154, 156) on the wire side of the package (104).

As to claim 7, Moden et al. discloses a system (Fig. 9) wherein the plurality of first mateable alignment features are female (152) and the plurality of second mateable alignment features are male (154, 156).

As to claims 5-6 and 8, Moden et al. does not disclose a system (Fig. 9) wherein the plurality of first mateable alignment features are male and the plurality of second mateable alignment features are female; the plurality of first mateable alignment features are male and the plurality of second mateable alignment features are male; and wherein the plurality of first mateable alignment features are female and the plurality of second mateable alignment features are female. However, it would have been an obvious matter of design choice to one of ordinary skill in the art to use different kinds of connectors such as male and female connectors aligned on each first or second mateable alignment of the package depending upon the other package's connectors to be connective [In re Leshin, 125 USPQ 416].

As to claim 9, figure 9 shows the plurality of first mateable alignment features (152) and the plurality of second mateable alignment features (154, 156) orient adjacent packages in a unique location.

As to claim 10, figure 9 shows the plurality of first mateable alignment features (152) and the plurality of second mateable alignment features (154, 156) are arranged asymmetrically.

As to claim 11, figure 9 shows the plurality of first mateable alignment features (152) and the plurality of second mateable alignment features (154, 156) comprising of at least one unique alignment feature.

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As to claim 12, figure 9 shows the plurality of first mateable alignment features (152) and the plurality of second mateable alignment features (154, 156) support adjacent packages (104) during solder ball reflow.

Claim 19 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 20 recites limitations similar to claim 4. Therefore, it is rejected for the same reasons.

Claims 21-22 recite limitations similar to claims 56. Therefore, they are rejected for the same reasons.

Claim 23 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claim 24 recites limitations similar to claim 8. Therefore, it is rejected for the same reasons.

Claims 25-28 recite limitations similar to claims 912. Therefore, they are rejected for the same reasons.

Claim 35 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 36 recites limitations similar to claim 4. Therefore, it is rejected for the same reasons.

Claim 39 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 37-38 and 40 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claims 41-44 recite limitations similar to claims 912. Therefore, they are rejected for the same reasons.

Claim 48 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 51 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 49-50 and 52 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claim 55 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 58 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 56-57 and 59 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claims 60-63 recite limitations similar to claims 912. Therefore, they are rejected for the same reasons.

Response to Arguments

Applicant's arguments with respect to claims 1, 37, 19-33 and 35-63 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREEMONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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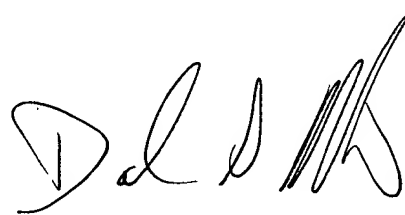
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (703) 305-4757. The examiner can normally be reached on Monday through Thursday and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin, can be reached on (703) 308-3121. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-4431.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-9556.

TYT

A handwritten signature in black ink, appearing to read 'D. S. Martin', with a stylized flourish at the end.

DAVID S. MARTIN
PRIMARY EXAMINER
GROUP 2100